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# SYNONYMY OF *DASYMUTILLA SICHELIANA* (SAUSSURE) (HYMENOPTERA: MUTILLIDAE)[1]

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*Abstract.*—*Dasymutilla sicheliana* (Saussure) and *D. thera* (Cameron) have been known from females only, and were synonymized by Mickel in 1965. *Dasymutilla intermixta* Mickel and *D. thalia* (Cameron) have been known from males only. Examination of the holotypes and long series of specimens of both has shown these males to be the same species. Pitfall trap collections of both males and females at the Leslie Canyon National Wildlife Refuge near Douglas, Arizona, as well as collection data from specimens collected in both the United States and Mexico, have led to the conclusion that these are male and female of the same species. The name *D. sicheliana* has precedence. A complete synonymy is included.

*Key Words.*—Insecta, Hymenoptera, Mutillidae, *Dasymutilla sicheliana, Dasymutilla intermixta, Dasymutilla thalia,* synonymy.

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*Dasymutilla sicheliana* was first described as *Mutilla sicheliana* by Saussure (1867). Saussure made his description on the basis of five female specimens, all from Mexico (two from Cordilliere and three from Tehuacan), and noted three different variations. Mickel examined Saussure's material in 1931 (unpublished notes) and designated a lectotype. That specimen is in the Geneva Museum, as are Saussure's other specimens.

*Sphaerophthalma* (sic.) *prunotincta* was described as a new species by Cockerell (1895) on the basis of a female found in Guanajuato, Mexico, by Dr. A. Duges. Although Cockerell made comparisons to several other species in his description, there was no reference made to *M. sicheliana.* After examination of Duges' type specimen, André (1898) wrote that *S. prunotincta* was a synonym of *M. sicheliana.* The type specimen for *S. prunotincta* has since been lost (Mickel 1928, 1965).

*Sphaerophthalma* (sic.) *thera* was described as a new species by Cameron (1895) on the basis of a female found in Milpas, Mexico, by Forrer. That type was examined by Mickel and found to be a synonym for *D. sicheliana* (1965). The holotype of *S. thera* is in the British Museum. *Mutilla gynaecologica* is listed as a new name for *S. thera* by Dalle Torre (1897).

The type specimens of *M. sicheliana* and *S. thera* were examined by DGM and found to be in agreement with Mickel. *Dasymutilla sicheliana* has been previously known only from the female, with its distribution being Arizona and Mexico.

*Dasymutilla intermixta* was described by Mickel (1928). The holotype for this species is in the University of Minnesota collection, and has been examined by

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DGM. It has been known only from the male, with its distribution being Arizona and New Mexico.

*Sphaerophthalma* (sic.) *thalia* was described by Cameron (1895) on the basis of two male specimens found in Guerrero, Mexico by H. H. Smith. The holotype is in the British Museum, and has been examined by DGM. It has been known only from the male, with its distribution being listed as Mexico.

## Materials and Methods

Beginning in 2000, U. S. Fish & Wildlife personnel (WRR) collected mutillids coincidentally with targeted reptiles and amphibians being live-trapped as part of a population dynamics study. The collections were made at Leslie Canyon National Wildlife Refuge in Cochise County, Arizona; Township 21 South, Range 28 East, Section 20 (Lat: 31°35.330′ Long: 109°30.500′). Trap arrays were located at an elevation of 1419 m in various microhabitats within the canyon's riparian corridor. Each array consisted of pitfall traps (19-liter capacity buckets buried in the ground to the rim) at the end of 7.6 m sections of tan-painted, metal drift fences 36 cm high having 2-compartmental funnel traps located at the center of the fence. The funnel traps were boxes 1.2 m long by 0.6 m wide, and 0.3 m high constructed of 2.3 mm (1/8″) hardware cloth separated longitudinally by a piece of plywood such that they functioned as two parallel traps. Funnels with 5 cm entrance holes led into these traps from each end. Funnels and pitfall traps were shaded from the sun with plywood coverings, and plywood bucket trap covers were elevated approximately 4 cm from ground level to provide access to reptiles, amphibians, and invertebrates. The plywood covers made it impossible for flying invertebrates to view the contents of the pitfall traps, and additionally made it virtually impossible for flying invertebrates to exit the traps once inside. About 5 cm of loose soil served as a substrate in the pitfall and funnel traps. In 2000, four trap arrays were operated from 5 April through 7 December. In 2001, eight trap arrays were in operation from 29 March through 6 December. Traps were checked approximately every other day to remove and record the vertebrates and invertebrates that were captured. All mutillids (Hymenoptera: Mutillidae) were collected, pinned, and shipped to Clemson University (DGM) for identification.

On 19 June 2000 one of the pitfall traps contained a single female of *D. sicheliana* and a single male of *D. intermixta.* On 20 June 2001 one of the pitfall traps contained a single female of *D. sicheliana* and eight males of *D. intermixta.* On 2 July 2001 one of the pitfall traps contained a single female of *D. sicheliana* and a single male of *D. intermixta.* All collections were by WRR, and no other mutillid specimens were collected in those traps on those dates.

*Material Examined.*—In addition to the type specimens mentioned above, the following material has been examined by DGM (all are females of *D. sicheliana* and males of *D. intermixta* and *D. thalia*): USA. ARIZONA. *COCHISE Co.*: Mouth of Carr Canyon, Huachuca Mts., 10 Aug 1940, C. D. Michener, 1 ♀; Garden Canyon, Huachuca Mts., 1954, W. H. Mann, 1 ♀ (homotype, *M. sicheliana*); Cottonwood Cañon, Peloncillo Mts., 25 Sep 1958, D. S. Creighton, 1 ♀; Portal, 8 Sep 1959, H. E. Evans, 1 ♂; Skeleton Canyon, 24 Aug 1962, P. Weens, 1 ♂ (homotype, *D. intermixta*); Carr Canyon, Huachuca Mts., 20 Jul 1969, G. H. & D. E. Nelson, 1 ♀ (homotype, *S. thera*); Miller Canyon, Huachuca Mts., 3 Apr 1973, R. F. Sternitzky, 1 ♀; Miller Canyon, Huachuca Mts., 21 Jun 1974, E. R. Hoebeke, 1 ♂; Chiricahua Mts., 9 Aug 1974, G. H. Nelson, 1 ♂ (homotype, *D. intermixta*); Portal, 12 Aug 1974, H. & M. Townes, 2 ♂; Portal, 13 Aug 1974, H. & M. Townes, 1 ♂; Portal, 30 Aug

1975, J. D. Pinto, 1 ♀; Ash Canyon, Huachuca Mts., 17 Aug 1980, S. Frommer, 1 ♂; 18.5 mi SE Willcox, 31 Aug 1980, McGinley & Woodley, 1 ♂ (homotype, *D. intermixta*); Portal, 19 Aug 1987, H. & M. Townes, 2 ♂; Portal, 23 Aug 1987, H. & M. Townes, 2 ♂; Portal, 1 Sep 1987, H. & M. Townes, 1 ♂; Leslie Canyon NWR, 2000, W. R. Radke, 7 Apr (1 ♀),19 Apr (1 ♀), 22 May (1 ♀), 5 Jun (3 ♀), 7 Jun (1 ♀), 12 Jun (2 ♀), 14 Jun (1 ♀), 16 Jun (1 ♀), 19 Jun (1 ♀), 19 Jun (1 ♀ and 1 ♂ taken together), 2 Jul (1 ♀), 14 Aug (1 ♀), 14 Sep (1 ♀), 20 Sep (2 ♀), 27 Sep (1 ♀); Leslie Canyon NWR, 2001, W. R. Radke, 9 May (1 ♀), 11 May (1 ♀), 25 May (1 ♀), 11 Jun (1 ♀), 21 Jun (1 ♀ and 8 ♂ taken together), 2 Jul (1 ♀ and 1 ♂ taken together). *PIMA Co.*: Santa Rita Mts., 1 Aug 1941, R. H. Beamer, 1 ♂ (homotype, *D. intermixta*); Molino Basin, Catalina Mts., 30 Jul 1958, R. M. Bohart, 1 ♀; Vail, 11 May 1965, Johnson, 1 ♀; Florida Canyon, 2 Jul 1967, J. E. Heppner, 1 ♀ (homotype, *S. thera*); 4 mi W Box Canyon, 25 Aug 1977, R. W. & R. M. Brooks, 1 ♂; Santa Rita Exper. Range, 3 Aug 1986, D. L. Gustafson, 1 ♂. *SANTA CRUZ Co.*: 12 mi E Nogales, 14 Sep 1966, R. W. Thorp, 1 ♂; Sycamore Canyon, Atascosa Mts., 14 Jun 1968, Flint & Menke, 1 ♂. NEW MEXICO. *CHAVES Co.*: Bitter Lake NWR, 20 Jul 1998, G. L. Warrick, 1 ♂. *HIDALGO Co.*: Antelope Pass, 17–21 Aug 1992, B. Tomberlin, 1 ♀. COSTA RICA. GUANACASTE. S. Rosa Park, 12 Feb 1978, D. H. Janzen, 1 ♂; S. Rosa Park, 11 Mar 1978, D. H. Janzen, 2 ♂. MEXICO. AGUACALIENTAS. 6 mi E Calvillo, 11 Jul 1983, Kovarik, Harrison & Schaffner, 1 ♀ (homotype, *S. thera*). CHIAPAS. 3 mi NW Petlalcingo, Pueblo, 2 Apr 1962, L. A. Stange, 1 ♀. CHIHUAHUA. Morelos, Cuernavaca, Dec 1944, N. L. H. Krauss, 1 ♀ (homotype, *M. sicheliana*); Santo Nino, 26 Jul 1968, T. A. Sears, R. C. Gardner & C. S. Glasner, 1 ♀; Santo Nino, 10 Aug 1968, T. A. Sears, R. C. Gardner & C. S. Glasner, 1 ♀. COLIMA. Manzanillo, 1–2 Aug 1965, H. E. Evans, 1 ♂ (homotype, *S. thalia*). GUERRERO. Zumpango, 22 Jul 1963, F. D. Parker & L. A. Stange, 1 ♂. JALISCO. Plan de Barrancas, 24 Mar 1962, F. D. Parker, 1 ♀/9 ♂; Plan de Barrancas, 24 Mar 1962, L. A. Stange, 2 ♀/2 ♂; 8 mi SE Plan de Barrancas, 8 Jul 1963, F. D. Parker & L. A. Stange, 1 ♂; 14 mi S Guadalajara, 11 Aug 1970, R. L. Villegas, 1 ♂; Teocaltiche, 26 Aug 1979, B. Villegas, 1 ♀; Chamela Biol. Stn., 16–20 Jul 1989, R. W. Brooks, 1 ♂. NAYARIT. 24 mi S Tepic, 7 Jul 1963, F. D. Parker & L. A. Stange, 1 ♀. OAXACA. 10 mi N Miltepec, 31 Jul 1972, ME-66, R. R. & M. E. Murray, 1 ♀ (homotype, *M. sicheliana*). SINALOA. 8 mi N Elota, 18 Mar 1962, F. D. Parker, 1 ♂; Chupaderos, 15 May 1962, F. D. Parker & L. A. Stange, 2 ♂; 8 mi S Elota, 19 May 1962, F. D. Parker, 1 ♀; 8 mi SE Elota, 19 May 1962, F. D. Parker, 2 ♀/1 ♂; 8 mi SE Elota, 19 May 1962, L. A. Stange, 1 ♀; 8 mi S Elota, 2 Jul 1963, F. D. Parker & L. A. Stange, 1 ♀; Chupaderos, 3 Jul 1963, F. D. Parker & L. A. Stange, 1 ♀; 8 mi S Elota, 26 Aug 1963, F. D. Parker & L. A. Stange, 2 ♀; Rio Choix, 19 Jul 1968, Sears, Gardner & Glaser, 1 ♂; 4 mi NW Choix, Arroyo del Saucillo, 12 Aug 1968, Sears, Gardner & Glaser, 1 ♂; Magistral, 18 Aug 1985, G. Ekis, 2 ♂; Santa Ana, 2 Aug 1985, G. Ekis, 1 ♂. SONORA. La Aduana, 22 May 1962, F. D. Parker & L. A. Stange, 2 ♂; Alamos, 7 Sep 1977, R. W. Brooks, 1 ♂; Santa Ana R., 4 Aug 1985, G. Ekis, 2 ♂; 108km W Hermosillo, 16 Aug 1991, R. L. Minkley, 1 ♂. ZACATECAS. Rio Grande, 19 Aug 1979, R. L. Villegas, 1 ♂.

## Discussion

The color of the pubescence is a variable characteristic that is often used in mutillid species descriptions. While color is a useful character, it can be misleading where series are limited or when pubescence is worn off in older specimens. Mickel (1931, unpublished notes) confirmed that Saussure's three variations of *D. sicheliana,* which were based on color differences, are the same species, as well as the fact that *S. thera* is a synonym of *D. sicheliana* (1965). We are in agreement with those assessments.

The holotypes of *D. intermixta* and *S. thalia* have been examined and found to be identical except for slight variations in color of pubescence, and collection locality. Previously known specimens of *S. thalia* were all from Mexico, whereas previously known specimens of *D. intermixta* were all from Arizona. Examination of long series of specimens from both Mexico and the United States has shown color variation in specimens from both countries to be similar. There is no justification for recognition of the two as separate species.

Positive sex correlation can be established by collection of mating pairs or

collection of both sexes from host cells. However, hosts are known for only a small percentage of mutillid species, and it is very difficult to obtain mating pairs in nature as mating may be very rapid (Manley & Deyrup 1989). In earlier studies, Manley (1999a, b) has shown the practice of caging females to be an alternative and reliable means of establishing sex correlation in mutillids.

In this study there was no deliberate attempt to cage females. However, on three different occasions, females of *D. sicheliana* that were collected in pitfall traps attracted males of *D. intermixta* into the traps. The fact that in all three instances no other mutillids (females or males) were in the traps is very strong evidence that these are male and female of the same species. And, although it is not known whether Parker and Stange (1962, see Material Examined) found other species of mutillids at the same time, the fact that they found females of *D. sicheliana* in conjunction with males of *D. intermixta* at three different times lends support to this conclusion. All specimens examined in this study, with the exception of the type specimens, are in the collections of UC Davis and the author (DGM). Since the name *D. sicheliana* has precedence, that name shall stand. A synonymy for the species follows.

### *Dasymutilla sicheliana* (Saussure)

*Mutilla Sicheliana* Saussure, 1868: 360. ♀
*Sphaerophthalma prunotincta* Cockerell, 1895: 60. ♀
*Sphaerophthalma thera* Cameron, 1895: 358. ♀ Preocc. In *Mutilla* by Smith, 1864.
*Sphaerophthalma thalia* Cameron, 1895: 372. NEW SYNONYM. ♂
*Mutilla gynaecologica* Dalla Torre, 1897: 45. ♀ N. name.
*Dasymutilla intermixta* Mickel, 1928: 256. NEW SYNONYM. ♂

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